RISC PC

Data Sheet 11
Developing for the Risc PC

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While most existing applications developed for RISC OS 3 will function satisfactorily on the Risc PC, its advanced architecture provides new opportunities for developers to produce high-performance applications for a wide variety of markets. The enhanced hardware architecture of the Risc PC has enabled RISC OS to be extended in several areas, providing a broader API for the programmer developing applications. The specification and performance of many of the hardware interfaces has been extended too - in particular the expansion card interface.

Enhanced colour capability

The use of the new Video Controller, VIDC20, provides for an enhanced colour capability. Applications software can take advantage of screen modes offering 1, 2, 4, 8, 16 or 32 bits per pixel (bpp) with a choice of up to 16 million colours. In the new 16 bpp modes, 5 bits are allocated for Red, Green and Blue, and in the 32 bpp modes, 8 bits each are allocated. ColourTrans operations have been extended to cater for best matching between application colours and the actual screen palette in use. The VIDC20 palette now includes supremacy bit information as part of the 32-bit word which provides support for transparency and overlay colours. Screen resolutions can extend up to 1280 x 1024 without the addition of further graphics cards. To support this greatly enhanced colour capability, a new sprite format has been introduced for bit-mapped graphics and SWI calls extended to support the wider range of screen displays. A new Colour Picker is supported by RISC OS which allows applications to provide flexible desktop dialogue boxes with which the user can manipulate colours in RGB, CMYK and HSV colour models. To enable

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applications using higher resolution graphics and colour depths to remain very fast in performance, Risc PC machines can be fitted with VRAM. VIDC20's 64-bit bus can take full advantage of any VRAM fitted and there are new operating system SWI calls in RISC OS to allow the programmer access to control the optimum use of the fitted DRAM/VRAM.

Greatly increased memory

The fact that the Risc PC can address up to 256MB of DRAM (see Memory information sheet) in addition to 2MB of VRAM has resulted in extensions to the API for memory control by applications. The opportunity has also been taken to improve the RISC OS memory model, which together with the smaller memory page size of 4KB, has allowed for more efficient use of any memory fitted to the computer. Dynamic areas of memory can now be created and removed in addition to being resized in an efficient way. Fragmentation effects are reduced and new operating system calls allow applications to recognise more available memory. To complement this fast, extended memory architecture, DMA is now available for two of the expansion card positions.

32-bit expansion bus

In addition to the provision of DMA capability on two of the expansion card connectors, the expansion bus now has 32-bit capability in addition to the previous 8- and 16-bit modes. Cards also now have access up to 16MB of their own memory space. Higher performance I/O cards can now be designed, allowing data transfers of around 5MB/sec or more; advantage can now be taken, for example, of the higher speed capabilities of the SCSI-2 specification. Developers should note that double-width expansion cards are no longer supported and single-width cards should meet the more stringent Eurocard width of 100 mm.

High-speed Serial and Parallel ports

In line with the ever more demanding needs of users for faster peripheral device support, both the Parallel and Serial ports provide faster data rates under the control of the programmer when required. A new buffer manager has been added to RISC OS and the Parallel port takes advantage of this. The buffer manager allows applications that require low latency to bypass the usual SWI call interface by making one initial call to set up memory pointers. These pointers address control routines that manage data transfer to and from the parallel device through software buffers, minimising interrupt demands on the main processor and allowing many recently introduced fast-parallel devices to be supported. The Serial port now incorporates hardware buffers which allow baud rates up to 115Kb/sec, again minimising interrupt demands on the main ARM processor. A new SWI call has been included which enables applications to determine what types of I/O system chips are fitted, allowing applications to make optimum use of the platform on which the application is running.

Second processors

Hardware expansion capabilities are not limited to the area of I/O. A second processor socket is provided on the main PCB which allows an alternative processor to be added to the computer. This processor has full access to the 32-bit bus and memory areas, but will need to include its own bus arbitration logic.

Networking

Networking capability is supported via an optional plug-in network card on the main PCB. The optional card is intended to support either Ethernet or Econet.

Primary font

Developers providing application software for schools, and currently supplying a font specifically for early learning purposes, should be pleased to hear that Risc PC now includes as standard Sassoon Primary Type, a non-serif typeface, in addition to those previously supplied.

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